

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee : Tsuyoshi Oda

Application to
Reissue Patent No. : 5,703,646

Issued : December 30, 1997

For : **PICTURE ENCODING METHOD, PICTURE
ENCODING APPARATUS AND PICTURE
RECORDING MEDIUM**

DECLARATION OF TSUYOSHI ODA

As a below-named inventor, I hereby declare that:

1. My residence, post office address and citizenship are as stated below next to my name.
2. I verily believe myself to be the original, first inventor of the invention described and claimed in Letters Patent No. 5,703,646 and in the specification filed herewith for which I solicit a patent.
3. I hereby state that I have reviewed and understand the contents of the aforementioned specification, including the claims.
4. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).
5. I hereby claim foreign priority benefits under Title 35, United States Code § 119 of Application Number 5-105943, filed April 9, 1993 and PCT/JP94/00610 filed April 11, 1994 and state that no other application for patent or inventor's certificate or any PCT international application was filed by me on the same subject matter prior to April 9, 1993.

6. I do not know and do not believe that the invention was ever known or used in the United States of America before my invention thereof.

7. I verily believe the original Letters Patent to be wholly or partly inoperative or invalid by reason of my claiming more or less than I had right to claim in the patent by at least failing to claim a method and an apparatus including:

(A) An encoding method for encoding source video data, the method comprises the steps of encoding said source video data to generate first encoded data; detecting a difficulty of the encoding process of source video data based on bit amount of said first encoded data; deciding an optimum quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and said quantization step size becomes larger when source video data to be encoded is more simple; and encoding said source video data by using said optimum quantization step on encoding unit basis.

(B) An encoding method for encoding source video data, the method comprises the steps of calculating a difficulty of said source video data, wherein said difficulty indicates a complexity of a picture within said source video data; deciding an optimum quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and said quantization step size becomes larger when source video data to be encoded is more simple; and encoding said source video data by using said optimum quantization step.

(C) An encoding method for encoding source video data, the method comprises the steps of encoding said source video data to generate first encoded data; detecting a difficulty of the encoding process of source video data based on amount of said first encoded

data; calculating an allocated code quantity which is varied depending on said difficulty so that said allocated code quantity is more increased when said source video data is more complexity and said allocated code quantity is more decreased when source video data is more simple; and encoding said source video data based on said allocated code quantity.

(D) An encoding method for encoding source video data, the method comprises the steps of calculating a difficulty of said source video data, wherein said difficulty indicates a complexity of a picture within said source video data; calculating an allocated code quantity which is varied depending on said difficulty so that said allocated code quantity is more increased when said source video data is more complexity and said allocated code quantity is more decreased when source video data is more simple; and encoding said source video data based on said allocated code quantity.

(E) An encoding method for encoding source video data, the method comprises the steps of detecting motion vector of a macro block of said source video data; encoding said macro block of said source video data by using said detected motion vector to generate first encoded data; detecting a difficulty of the encoding process of source video data based on amount of said first encoded data; deciding an optimum quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and said quantization step size becomes larger when source video data to be encoded is more simple; and encoding said macro block of said source video data by using said optimum quantization step and said detected motion vector.

(F) An encoding method for encoding source video data, the method comprises the steps of selecting a predictive mode of a macro block of said source video data; encoding said macro block of said source video data by using said selected predictive mode to

generate first encoded data; detecting a difficulty of the encoding process of source video data based on amount of said first encoded data; deciding an optimum quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and said quantization step size becomes larger when source video data to be encoded is more simple; and encoding said macro block of said source video data by using said optimum quantization step and said selected predictive mode.

(G) An encoding apparatus for encoding source video data, the apparatus comprising means for detecting motion vector of a macro block of said source video data; first encoding means for encoding said macro block of said source video data by using said detected motion vector to generate first encoded data; means for detecting a difficulty of the encoding process of source video data based on amount of said first encoded data; means for deciding an optimum quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and said quantization step size becomes larger when source video data to be encoded is more simple; and second encoding means for encoding said macro block of said source video data by using said optimum quantization step and said detected motion vector.

(H) An encoding apparatus for encoding source video data, the apparatus comprising means for selecting a predictive mode of a macro block of said source video data; first encoding means for encoding said macro block of said source video data by using said selected predictive mode to generate first encoded data; means for detecting a difficulty of the encoding process of source video data based on amount of said first encoded data; means for deciding an optimum quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and

said quantization step size becomes larger when source video data to be encoded is more simple; and second encoding means for encoding said macro block of said source video data by using said optimum quantization step and said selected predictive mode.

(I) An encoding apparatus for encoding source video data, the apparatus comprising first encoding means for encoding said source video data to generate first encoded data; second encoding means for encoding said source video data based on supplied quantization step size to generate second encoded data; transmitting buffer for buffering said second encoded data; and control means for detecting a difficulty of the encoding process in said first encoding means, and for deciding said quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and said quantization step size becomes larger when source video data to be encoded is more simple, and said quantization step size which is varied depending on a remaining capacity of said transmitting buffer so as to suppress overflow and underflow in said transmitting buffer.

(J) An encoding apparatus for encoding source video data, the apparatus comprising encoding means for encoding said source video data based on a quantization step size to generate encoded stream; transmitting buffer for buffering said encoded stream; and control means for calculating a difficulty of said source video data, wherein said difficulty indicates a complexity of a picture within said source video data, and for deciding said quantization step size which is varied depending on said difficulty so that said quantization step size becomes smaller when said source video data is more complexity and said quantization step size becomes larger when source video data to be encoded is more simple, wherein said quantization step size which

is varied depending on a remaining capacity of said transmitting buffer so as to suppress overflow and underflow in said transmitting buffer.

8. I did not discover that the claims of the original patent claimed more or less than I had a right to claim until after the original patent was issued.

9. No claim was previously presented during prosecution of the above referenced issued patent that particularly claimed the method and apparatus described in paragraph 7 above.

10. The errors noted above, as well as any other errors to be corrected herein arose without any deceptive intention on my part.

11. New claims 16-25 submitted with this application particularly point out the subject matter which I considered my invention and round out the scope of protection to which I am entitled. By the omission of such claims the original patent claims less than I had a right to claim.

I hereby appoint William S. Frommer, Registration No. 25,506, and Dennis M. Smid, Registration No. 34,930, of Frommer Lawrence & Haug LLP or their duly appointed associate, my attorneys, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to file continuation and divisional applications thereof, to receive the Patent, and to transact all business in the Patent and Trademark Office and in the Courts in connection therewith, and specify that all communications about the application are to be directed to the following address:

William S. Frommer, Esq.
c/o Frommer Lawrence & Haug LLP
745 Fifth Avenue
New York, New York 10151

Direct all telephone calls to: (212) 588-0800 to the attention of William S. Frommer, Esq.

Wherefore I pray that I may be allowed to surrender the Letters Patent No.

5,703,646 granted December 30, 1997, whereof Sony Corporation, on whose behalf and with whose assent this application is made, is the sole owner, by Assignment, and that Letters Patent my be reissued to Sony Corporation for the same invention upon the attached specification.

I, the undersigned applicant, further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Tsuyoshi ODA

Date

Residence: Chiba, Japan

Citizenship: Japan

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New York, NY 10151

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Date of Deposit: December 29, 1999

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" Service under 37 CFR 1.10 on the date indicated above and is addressed to: Assistant Commissioner for Patents, Washington, DC 20231.

Charles Jackson
(Typed or printed name of person mailing paper or fee)

Charles Jackson
(Signature of person mailing paper or fee)

STATEMENT UNDER 37 C.F.R. §3.73 (b)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The undersigned attorney of record, empowered to sign this Statement on behalf of the assignee, states that **SONY CORPORATION**, a corporation of Japan, is the assignee of the entire right, title and interest in the patent application identified above by virtue of an assignment from the inventor of the parent application Serial No. 08/351,262 filed February 8,

1995, from which continuation application Serial No. 08/770,593 was filed which issued as U.S. Patent No. 5,703,646 on December 30, 1997, upon which the present application is a reissue thereof. The assignment was recorded in the Patent and Trademark office on February 8, 1995 at Reel 7386, Frame 881.

The undersigned has reviewed all the documents in the chain of title of the patent application identified above and, to the best of the undersigned's knowledge and belief, title is in the assignee identified above.

Respectfully submitted,
FROMMER LAWRENCE & HAUG LLP

By:

William S. Frommer by *Dennis M. Smid*
William S. Frommer
Reg. No. 25,506
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745 Fifth Avenue
New York, NY 10151

ASSENT OF ASSIGNEE

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Sony Corporation, the assignee of the full and entire right, title and interest in the above-mentioned Letters Patent by reason of an assignment from the inventor, recorded on February 8, 1995 at Reel 7386, Frame 881, hereby assents to the accompanying application to reissue same.

SONY CORPORATION

Date: _____

By: _____